Figure 1. Encoder Overview

Figure 2 : Decoder Overview
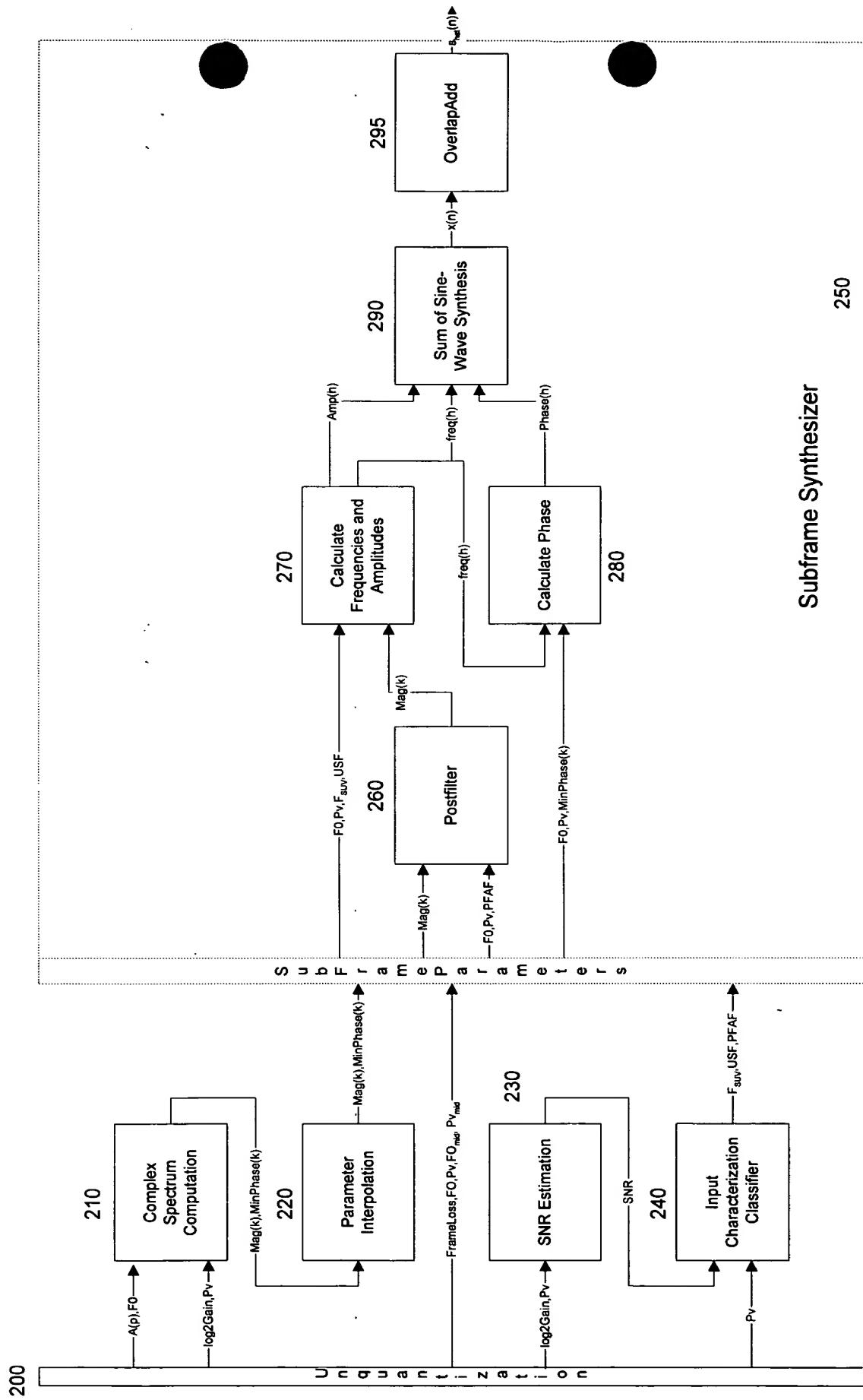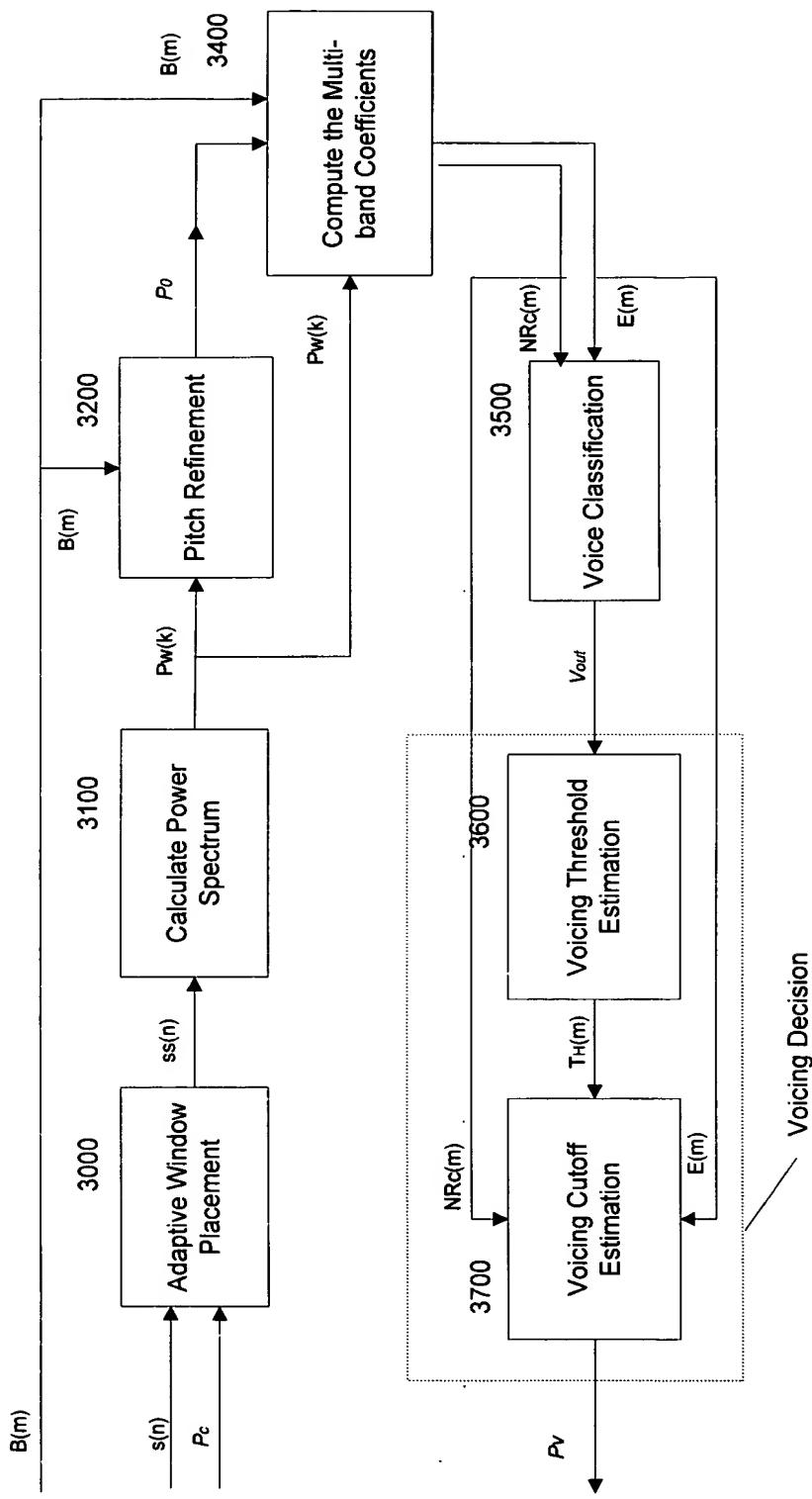
Figure 3 Voicing Estimation
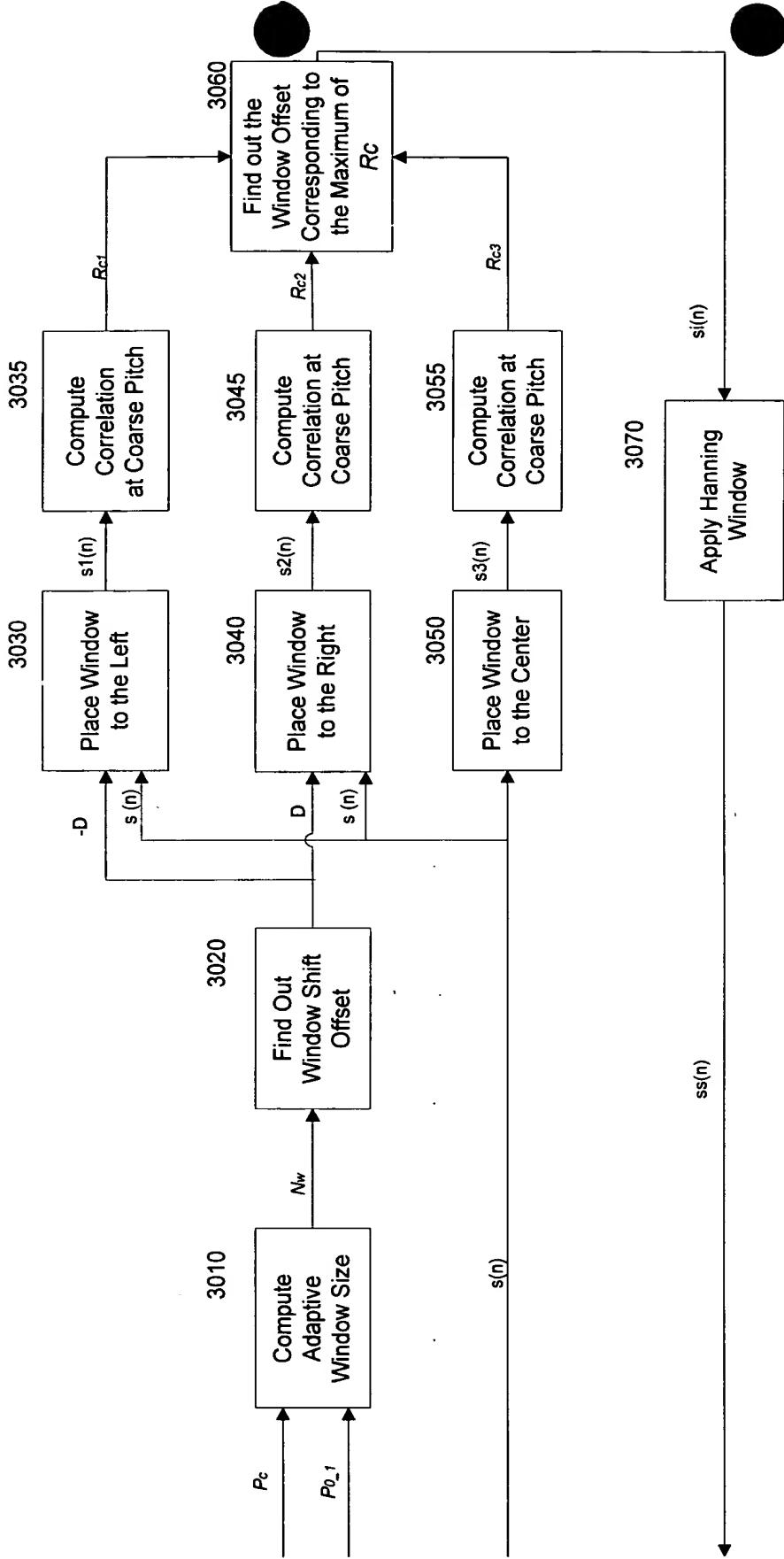
Figure 3.1. Adaptive Window Placement
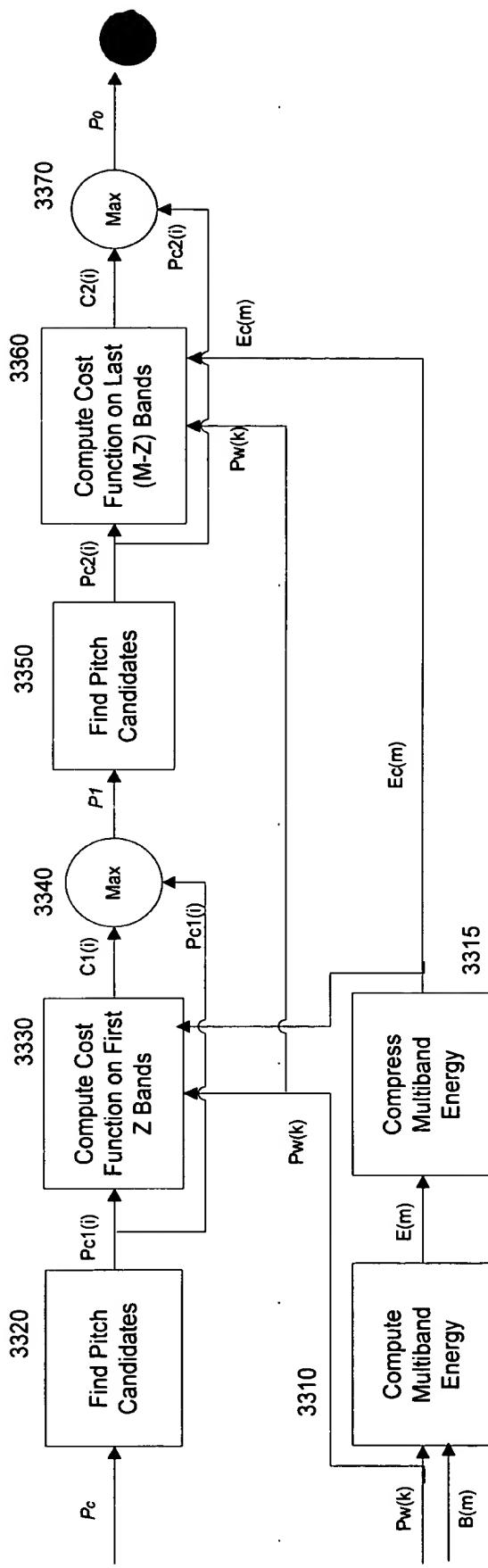
Figure 3.2. Pitch Refinement
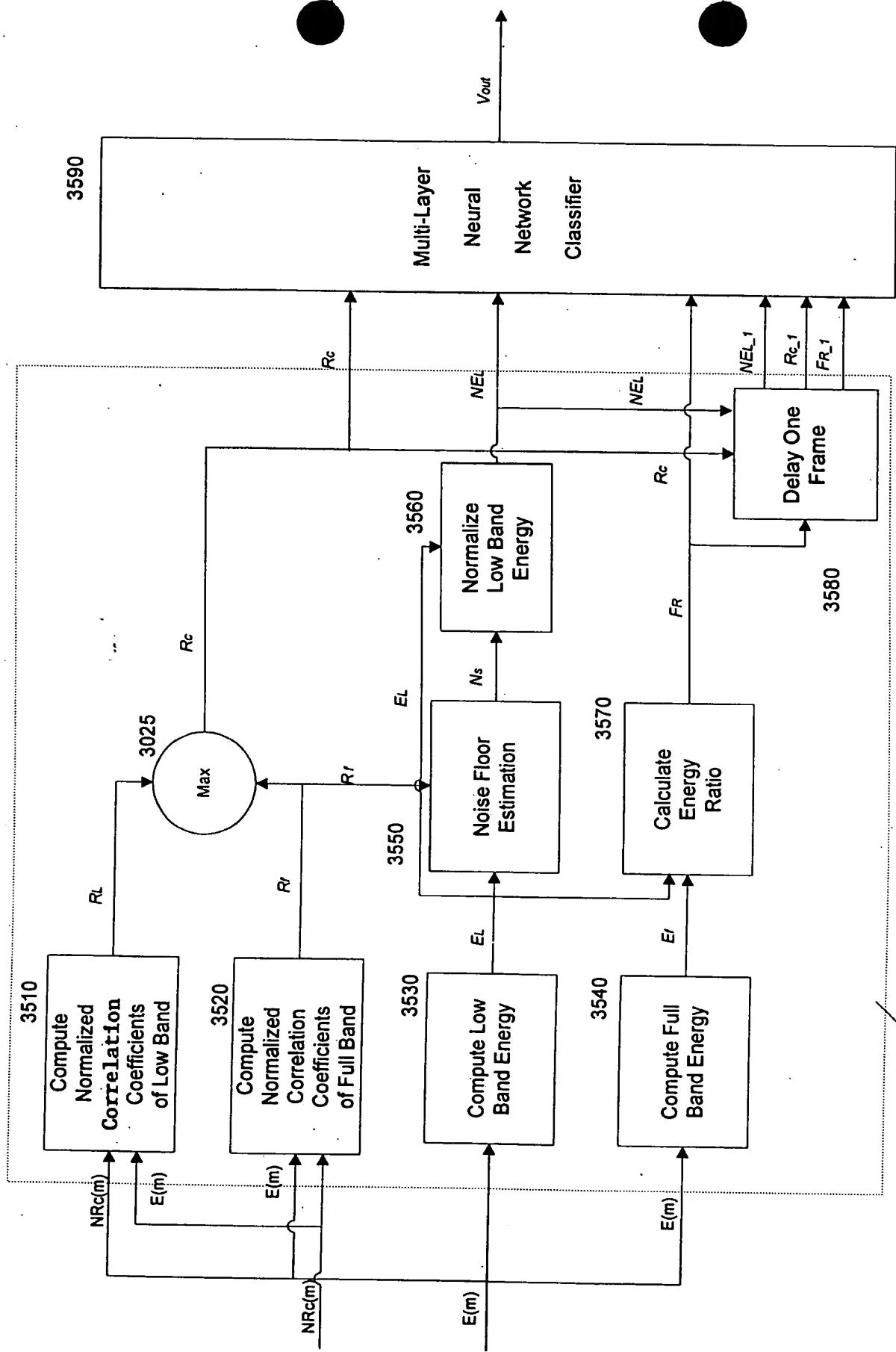
Figure 3.3. Voice Classification
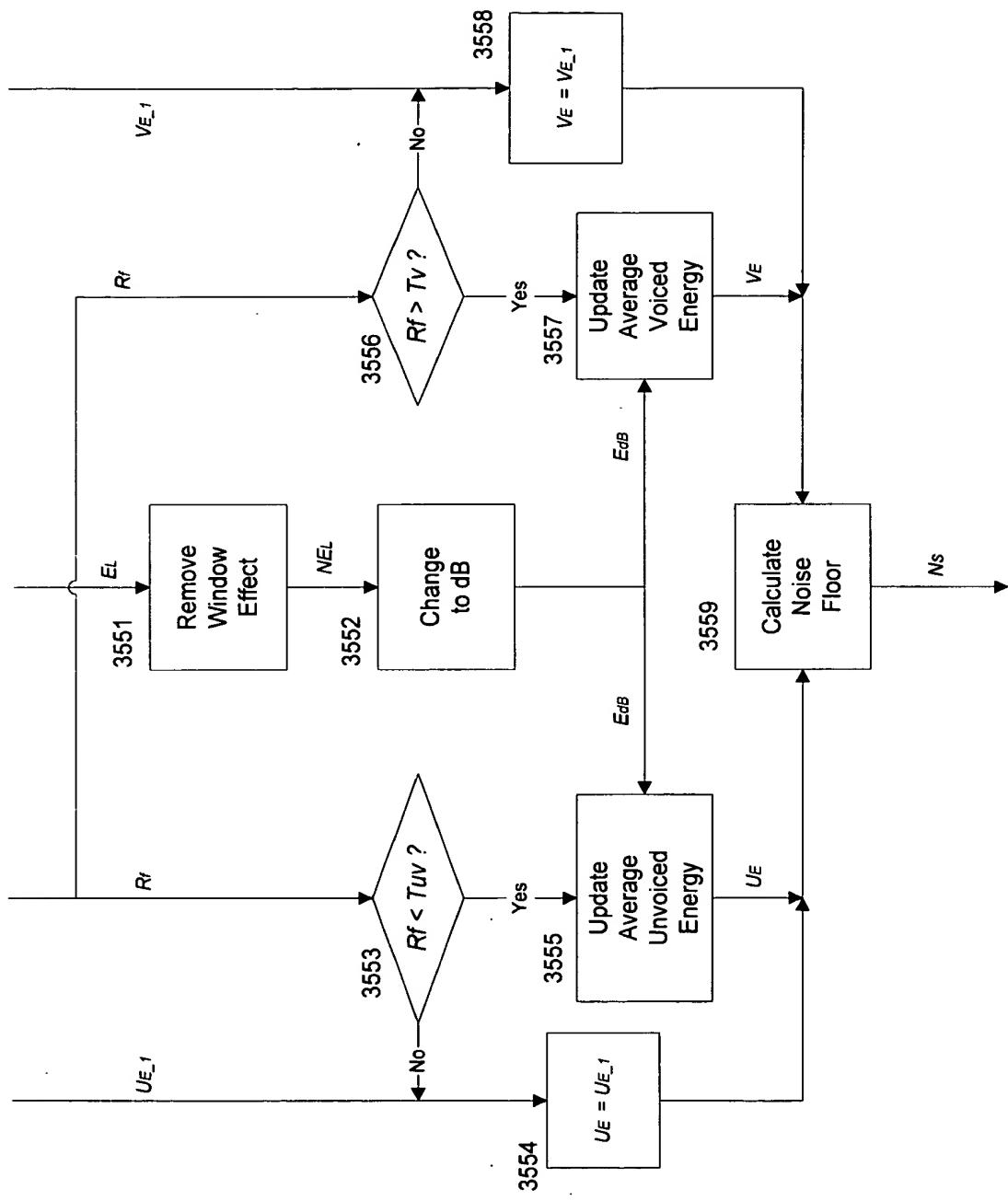
Figure 3.3.1. Noise Floor Estimation
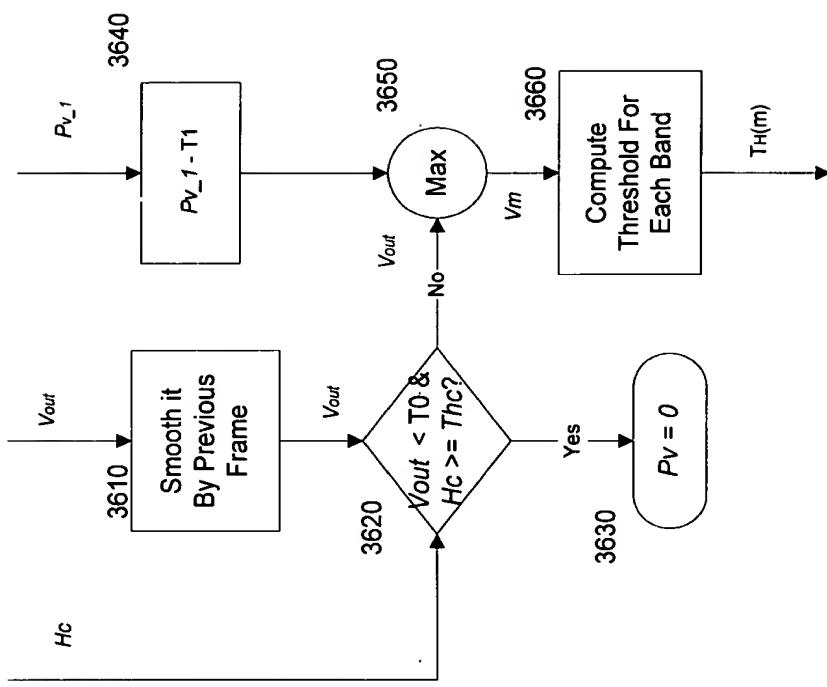
Figure 3.4. Voicing Threshold Estimation

Figure 3.5. Voicing Cutoff Estimation

$NR_c(m)$ →

$T_H(m)$ →

3705 Smooth Normalized Multi-band Correlation by Previous Frame

3710 $i = 0$, $C_B = 0$

3715 $NR_{cm}(i) > T_H(i)$?

Yes →

3720 Calculate Normalized Correlation from 0 to i Band

T_{RC}

3725 Calculate Weighted Normalized Correlation from (i-2) to i Band

W_{RC}

3730 $T_{RC} > T2$ && $W_{RC} > T2$?

Yes →

No →

3735 $i - C_B < T3$?

Yes →

No →

3740 $C_B = i$

No →

3745 $i = i+1$

3750 Finish All Bands ?

Yes →

3755 Smooth C_B by the Previous Frame

C_B

3760 Convert to P_v

Figure 4 : Spectral Estimation
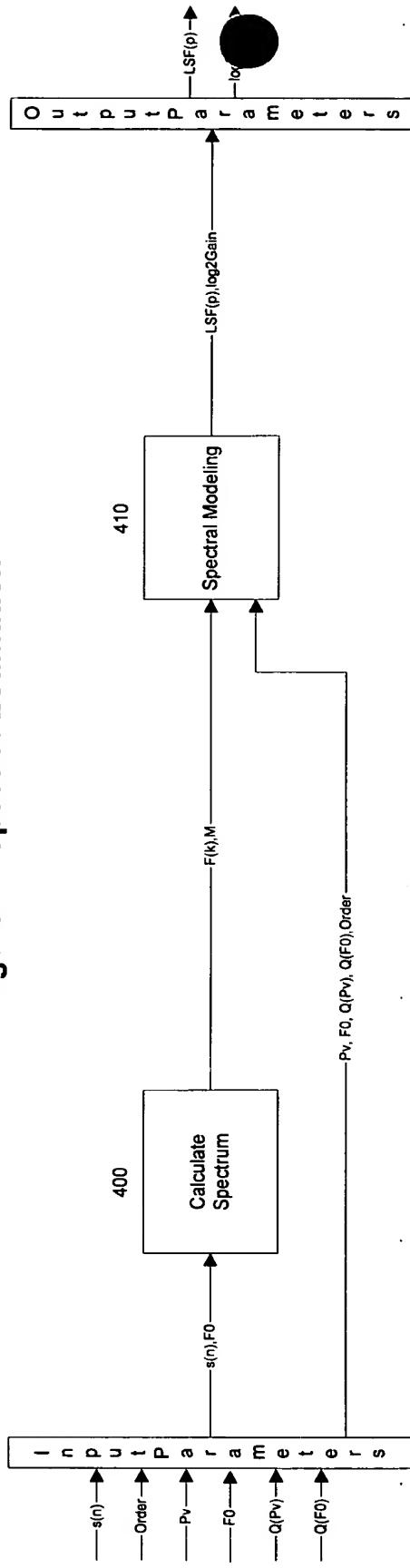
Figure 5 : Calculate Spectrum
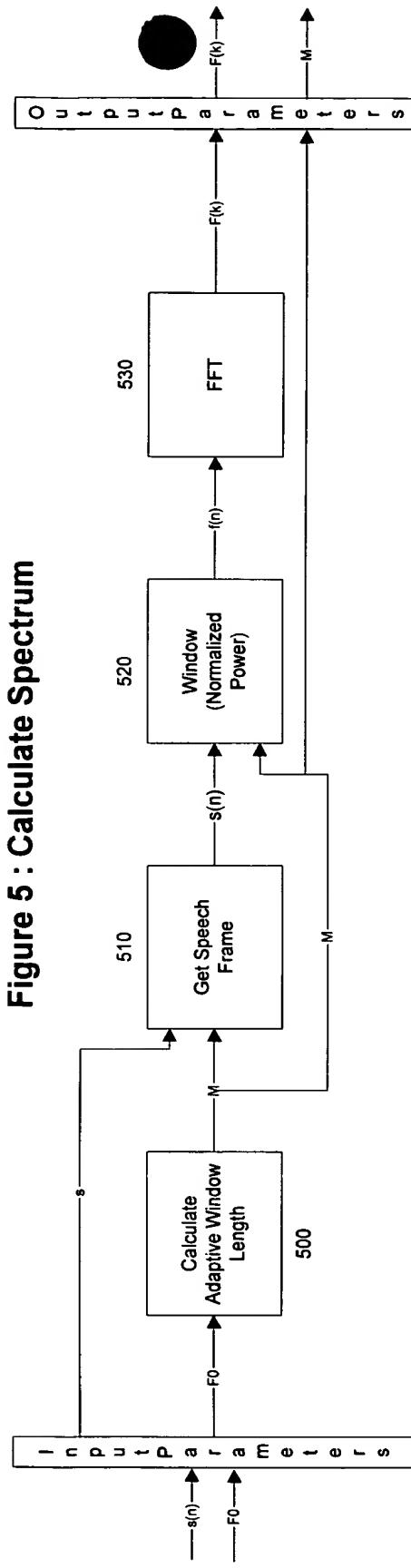
Figure 6 : Spectral Modeling
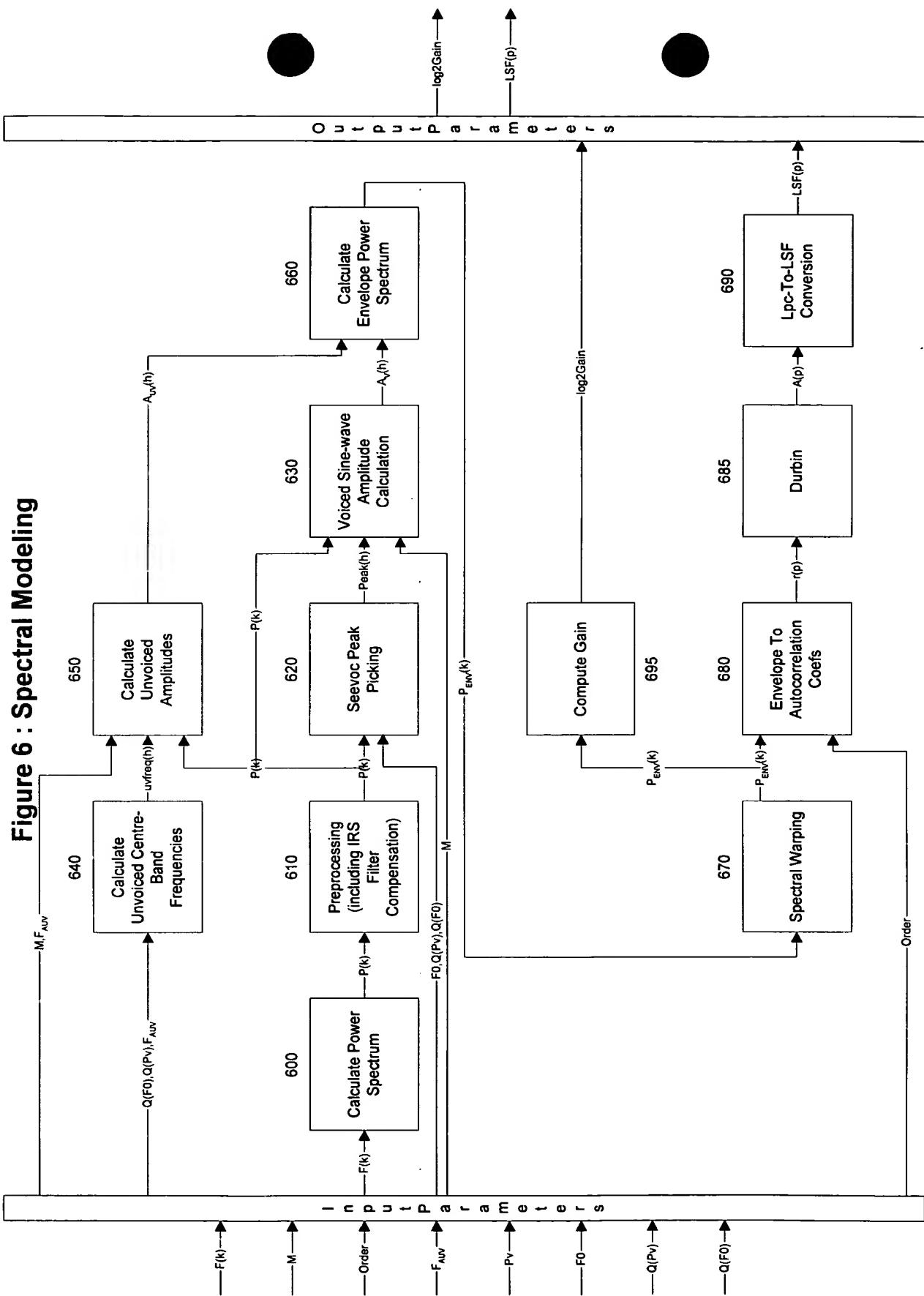
Figure 7 : Complex Spectrum Computation

Input Parameters

A(p) →
log2Gain →
F0 →
Pv →

A(p) →

700 Lpc To Cepstrum

Cs →

710 Cepstrum To Envelope

Mag(k) →

MinPhase(k) →

log2Gain,F0,Pv →

720 Normalize Envelope

Mag(k) →

730 UnWarp

MinPhase(k) →

Mag(k) →

740 IRS Filter Decompensation

Mag(k) →

MinPhase(k) →

Output Parameters

Mag(k) →

MinPhase(k) →

Figure 8 : SNR Estimation

Input Parameters

—log2Gain—

—Pv—

800 Convert to dB

—log2Gain—

—dBEnergy—

—dBEnergy—

810 Update Speech Energy Estimate

1. Sp_dB = Sp_dB(-1) - DECAY
2. If (Pv > VTh) AND (dBEnergy > Sp_dB)
   Sp_dB = dBEnergy

—Pv—

—Sp_dB—

820 Update Background Energy Estimate

1. Bkgd_dB = Bkgd_dB(-1) + INC
2. If (Pv < BkgdTh) AND (dBEnergy < Bkgd_dB)
   Bkgd_dB = dBEnergy

—Pv—

—Bkgd_dB—

830 (diamond, contains "-")

—SNR—

Output Parameters

—SNR—

Figure 9 : Calculate Frequencies and Amplitudes